Joint Tactical Networking Center Overview Briefing

17 July 2017

JTNC Overview

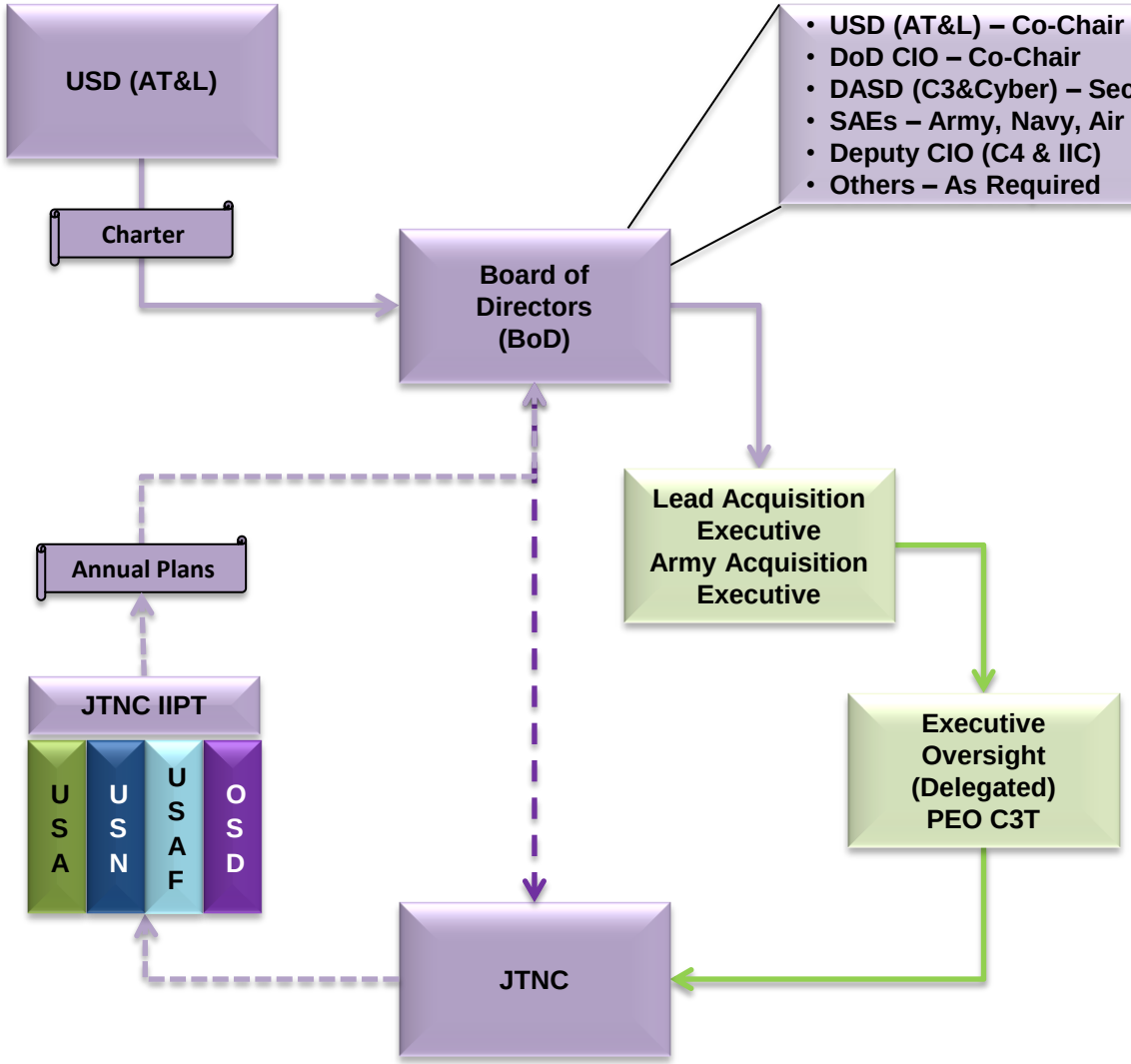
- The JTNC supports the DoD goal of ensuring interoperable, secure, and affordable waveforms and wireless communications products by recommending standards, conducting compliance and certification analyses, and maintaining the DoD Waveform Information Repository (IR).

  – JTNC Core Functions
    - DoD Waveform Standards & Software Communications Architecture
    - Technical Analysis of DoD Waveform IR products
    - DoD Waveform IR Management & Configuration Control
    - Technical Advisor to JTNC Board of Directors

JTNC Non-Core/Reimbursable Functions

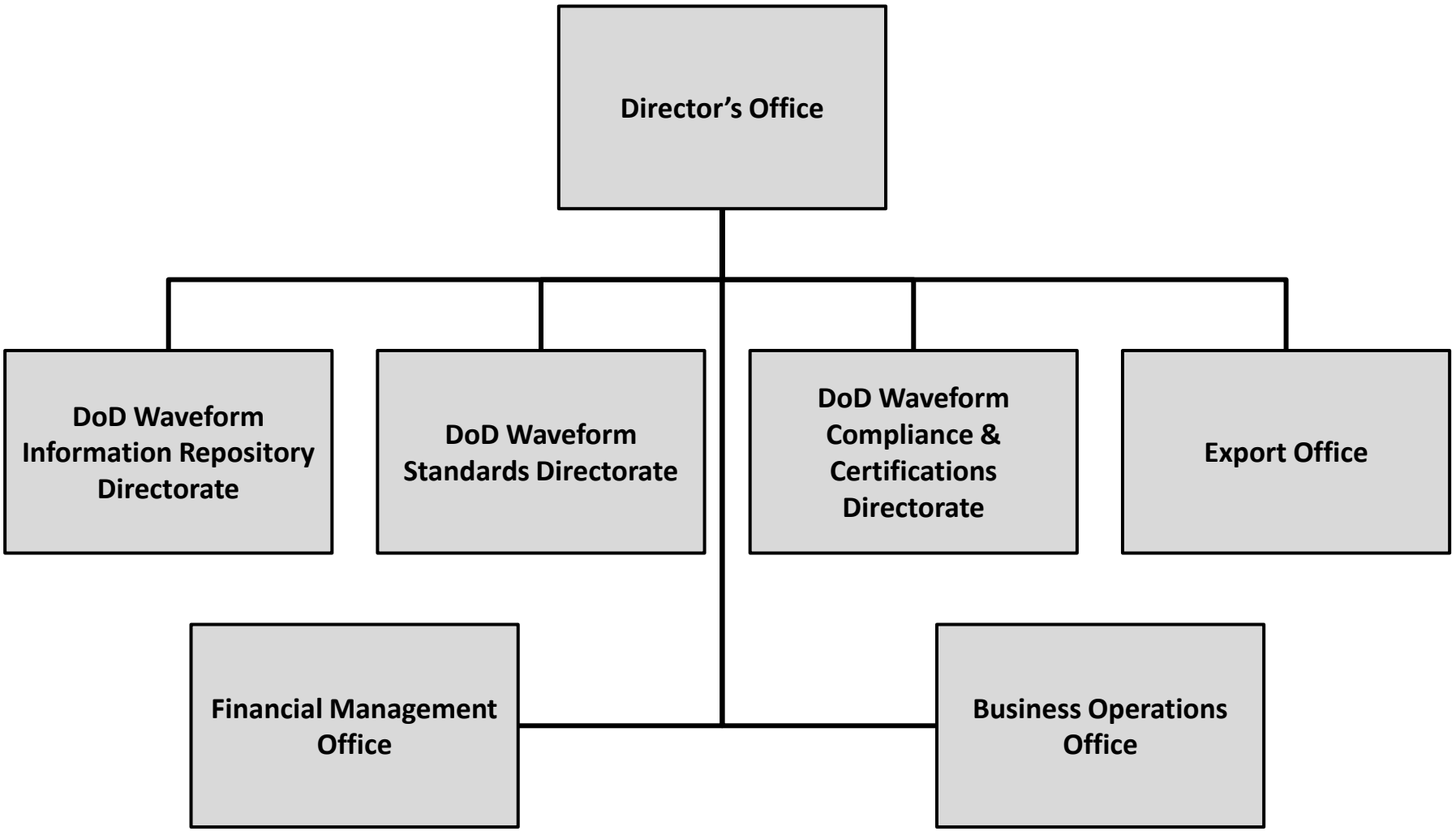
- JTNC may provide additional related services on a reimbursable basis such as:
  - Technical analysis of non-joint networking applications
  - Science & Technology project support
  - Waveform technology transition support
  - Request for Proposal/contracting support
  - International programs/project support
  - Service-unique waveform support
  - Joint networking application & Electronic Warfare system integration
  - Coalition waveform support

Governance and Resourcing



- JTNC BoD established to address waveform issues within DoD
- AAE is Lead Acquisition Executive for the JTNC
- Executive oversight of JTNC delegated to PEO C3T
- JTNC Management Plan approved annually by BoD
- Resourcing per annually updated Tri Military Department Resource Plan
- Other resourcing in accordance with approved non-core functions on a reimbursable basis

Organizational Structure



DoD Waveform Standards

JTNC Chartered Core Functions

- **DoD Waveform Standards**
  - Provides a validated open systems reference architecture that separates waveform/network manager from the radio set
  - Permits common waveform software to be deployed across multiple vendor's radio sets

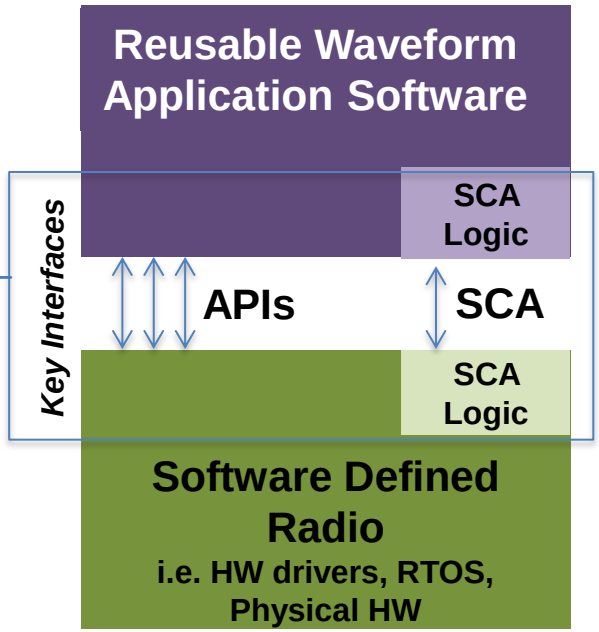
- **DoD Waveform Compliance and Certification (C&C)**
  - Perform technical analysis of candidate Waveform IR products that results in preliminary characterizations of Waveform IR products regarding whether they meet government standards and policies for secure interoperability.
  - Perform technical analysis of Waveform IR products for certification. This analysis will result in comprehensive characterization of Waveform IR products as to whether they meet DoD standards and policies for interoperable and secure joint tactical networking.

- **DoD Waveform IR**
  - Provides a cyber-hardened, DoD-wide waveform library and controlled access for waveforms and associated network managers, operating environment software, models, architectural standards and Application Program Interfaces (APIs)
  - Protects and distributes artifacts based on legal agreements between government and software developers

- **Technical Advisor to JTNC Board of Directors (BoD)**

SCA 4.1 & APIs Enable Modular Design and Designate Key Interfaces

- **Software Communications Architecture (SCA)**
  - Open architecture framework
  - Defines a standard way for radios to instantiate, configure, and manage waveforms applications running on their platform
- **Application Programming Interfaces (APIs)**
  - Suite of interface specifications
  - Define the key software interfaces that allow the waveform application software and radio platform software to interact



- **Benefits of SCA & APIs**
  - Scalable for difference missions and difference form factors
  - Reduced cost to port waveform vs. developing waveform
  - Modular design enables rapid integration of performance improvements and cybersecurity enhancements

SCA and APIs provide cost efficiencies for the Services by enabling reuse of waveform software across a multitude of DoD radios

SCA & APIs are Consensus Based Standards

- **JTNC Standards Directorate collaborates with and informs multiple entities on the evolution of the SCA & APIs to enable alignment with industry standards and DoD acquisitions**

Army	Navy	Air Force	Other Gov.	Industry	Standards Organizations	Non-US
▪ PM TR PdM Airborne, Maritime, and Fixed Station ▪ PM TR PdM Handheld, Manpack and Small-form Fit ▪ PM TR PdM Mid-tier Networking Vehicular Radios ▪ PM TR PdL Waveforms ▪ PM WIN-T PdM Joint Enterprise Network Manager ▪ PM Mission Command ▪ PEO Aviation ▪ CERDEC ▪ Natick Soldier Center	▪ PMA 101 ▪ PMW 146 ▪ PMW 120 ▪ PMA 209 ▪ SSC-PAC ISR Dept. ▪ SSC-PAC CHENG Panel ▪ SSC-LANT ▪ EODTECHDIV	▪ AFLCMC HBZB - Crypto Mod and Combat Survivor / Evader Locator (CSEL) group ▪ AFLCMC HNCCA - Mini Crypto and Tactical Key Management (TKM) Group, HN - C3I & Networks, WN - Agile Combat Systems, and HB - Battle Management	▪ Radio COMSEC Strategy Working Group ▪ NSA Information Assurance Directorate ▪ NSA REDHAWK ▪ DARPA Tactical Tech. Office ▪ USSOCOM Next Generation Manpack ▪ NRO – Special Comms Office ▪ Air, Land, Sea & Space TWG ▪ FBI – Operational Technology Division (OTD)	▪ Boeing ▪ General Dynamics ▪ Harris ▪ Northrop Grumman ▪ Raytheon ▪ Rockwell Collins ▪ Thales ▪ COBHAM ▪ PrismTech ▪ Reservoir Labs (SBIR) ▪ NordiaSoft	▪ WINNF ▪ Object Mgmt. Group ▪ The Open Group – Future Airborne Capability Environment (FACE)	▪ Canada ▪ Germany ▪ France

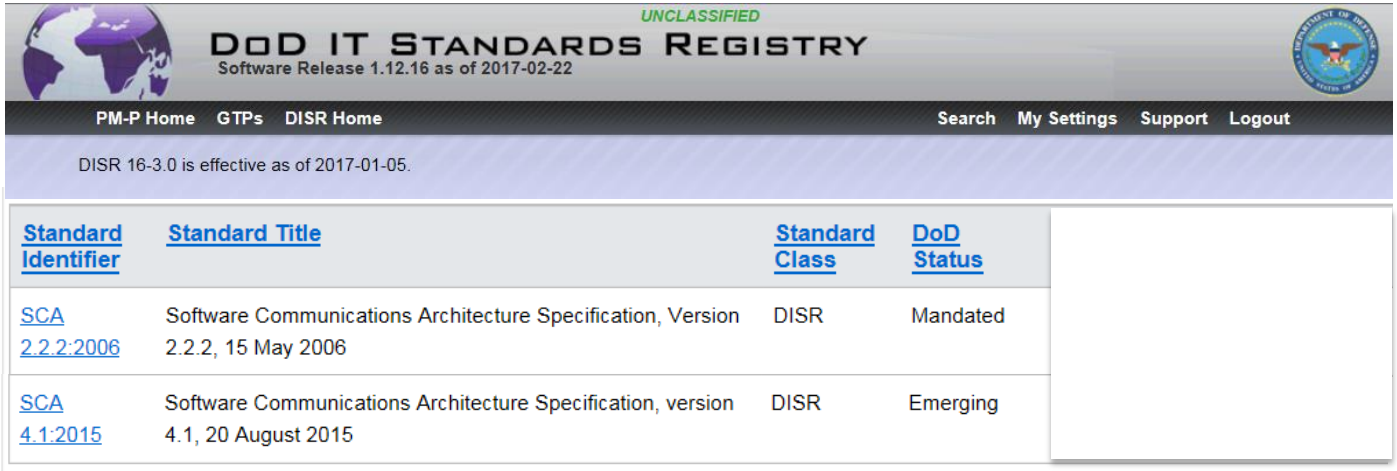
SCA & APIs in the DISR

39 JTNC specifications registered in the DoD Information Standards Registry (DISR)

Standard Identifier	Standard Identifier
SCA 2.2.2:2006	Tactical Radio API - M1553 Specification
SCA 4.1:2015	Tactical Radio API - Management Information Base (MIB)
Tactical Radio API - Device Input/Output (IO) 1.0.2	Tactical Radio API - Modem Hardware Abstraction Layer (MHAL) 3.0
Tactical Radio API - Audio Port Device 1.3.4	Tactical Radio API - MHAL on Chip Bus (MOCB) 1.1.5
Tactical Radio API - Barometric Pressure Transducer Device	Tactical Radio API - Network Layer Control Service
Tactical Radio API - CORBA Types 1.0.2	Tactical Radio API - Network Layer Service 1.0.1
Tactical Radio API - Device IO Control	Tactical Radio API - Package Management 1.0
Tactical Radio API - Device Message Control 1.1.3	Tactical Radio API - Packet 2.0.2
Tactical Radio API - Device Packet	Tactical Radio API - Platform Adapter 1.3.3
Tactical Radio API - Device Packet Signals	Tactical Radio API - Profile Manager Service 1.0
Tactical Radio API - Ethernet Device 1.2.2	Tactical Radio API - Retransmission Service
Tactical Radio API - Frequency Reference Device	Tactical Radio API - Radio Security Services (RSS) 3.2.7
Tactical Radio API - GPS Device 2.1.4	Tactical Radio API - RSS 4.0.1
Tactical Radio API - IO Signals	Tactical Radio API - Serial Port Device 2.1.4
Tactical Radio API - Internet Protocol (IP) Routing Service 1.2	Tactical Radio API - Suite B AES OTAT KEK Spec 1.3 **
Tactical Radio API - Key Encryption Key Std 1.3	Tactical Radio API - Tactical Public Key Infrastructure (TPKI)
Tactical Radio API - Key Tag Spec 1.2.7	Tactical Radio API - Transmission Control Protocol (TCP) Sockets Service
Tactical Radio API - Key Tag Spec 1.2.9	Tactical Radio API - Timing Service 1.4.4
Tactical Radio API - Key Tag FieldValueAffiliationReg 1.0.2 **	Tactical Radio API - Vocoder Service 1.4
Tactical Radio API - Link Layer Control (LLC) Service 1.0	** (approval pending)

DISR Website: https://gtg.csd.disa.mil

DoD Policy for Using DISR Standards



DoDI 8310.01, IT Standards in the DoD, 2 Feb 2015

"Program managers and developers will use IT standards in the DISR for IT system development, acquisition, and procurement to promote interoperability, information sharing, reuse, portability, and information security."

"IT system development, acquisition, and procurement must conform to all applicable mandatory standards profiles in the DISR or derived from the DISR."

DoDI 5000.02, Operation of the Defense Acquisition System, 7 Jan 2015

"Program Managers must develop solution architectures that comply with the DoD Information Enterprise Architecture, applicable mission area and component architectures, and DoD Component architecture guidance. A program's solution architecture should define capability and interoperability requirements, establish and enforce standards, and guide security and cybersecurity requirements."

DoD Waveform Compliance & Certification (C&C)

Waveform Analysis Process

- JTNC provides a technical analysis concentrating on a candidate waveform's interoperability, security, and affordability attributes, and provides a recommendation for the disposition of the waveform to the JTNC IIPT.
- JTNC evaluates waveforms against waveform specifications (explicit requirements) and relevant DoD and commercial standards (implicit requirements) through a systematic repeatable process.
- The analysis verifies the waveform's current maturity level, including the adequacy and completeness of the software code, tests performed, and associated documentation.
- Analysis information allows the waveform sponsor, Service, or program office implementing the waveform to consider identified issues based on their operational requirements, and to conduct an informed risk assessment on the reuse of the waveform for their specific application.

Waveform Analysis Process: Providing inputs to the DoD CIO on the technical feasibility and maturity of the waveform per DoDI 4630.09

Technical Analysis for Compliance & Certification

- Conduct Technical Analysis for Compliance & Certification (TACC) on Programs of Record (PoRs) and/or Non-Developmental Item (NDI) vendors developing software-definable tactical wireless devices.
  - Establishes a framework for DoD waveform and wireless communication software reuse
    - Provides risk analysis of test results for SDRs to ensure security, interoperability, and affordability
  - Decreases waveform Life Cycle Costs
    - Mitigates risks for Services seeking to procure and field SDRs executing DoD Waveform(s)
  - Facilitates competition among tactical communication SDR developers
    - Provides competitive advantage to PORs and NDI vendors for potential procurement opportunities
  - Provides feedback to independent vendors investing R&D funds towards capabilities focused on military modernization.

TACC: Instituting a proactive radio market by aligning with the USD(AT&L) "Better Buying Power" and DoD CIO Campaign Plan initiatives

CCEP & JTEL

- NSA Commercial COMSEC Evaluation Program (CCEP)
  - NSA enters into a direct business relationship with a commercial vendor to develop an Information Assurance (IA) product using vendor funds
  - Requires a government business case or sponsor to support NSA evaluation resources

CCEP: Evaluate those products that best provide for widespread availability of quality, inexpensive, secure communications systems for use by the U.S. Government.

- JTNC Test and Evaluation Laboratory (JTEL) serves as the test authority for SCA & APIs
  - Support Application/Waveform (WF) and Operating Environment (OE) Testing based on the DISR Standards
  - Provide SCA and API Compliance Verification Reports to the JTNC Director for Consideration

JTEL: Verification of conformance to established DoD Standards on Open Systems Architecture and Key Modular Interfaces.

DoD Waveform Information Repository (IR)

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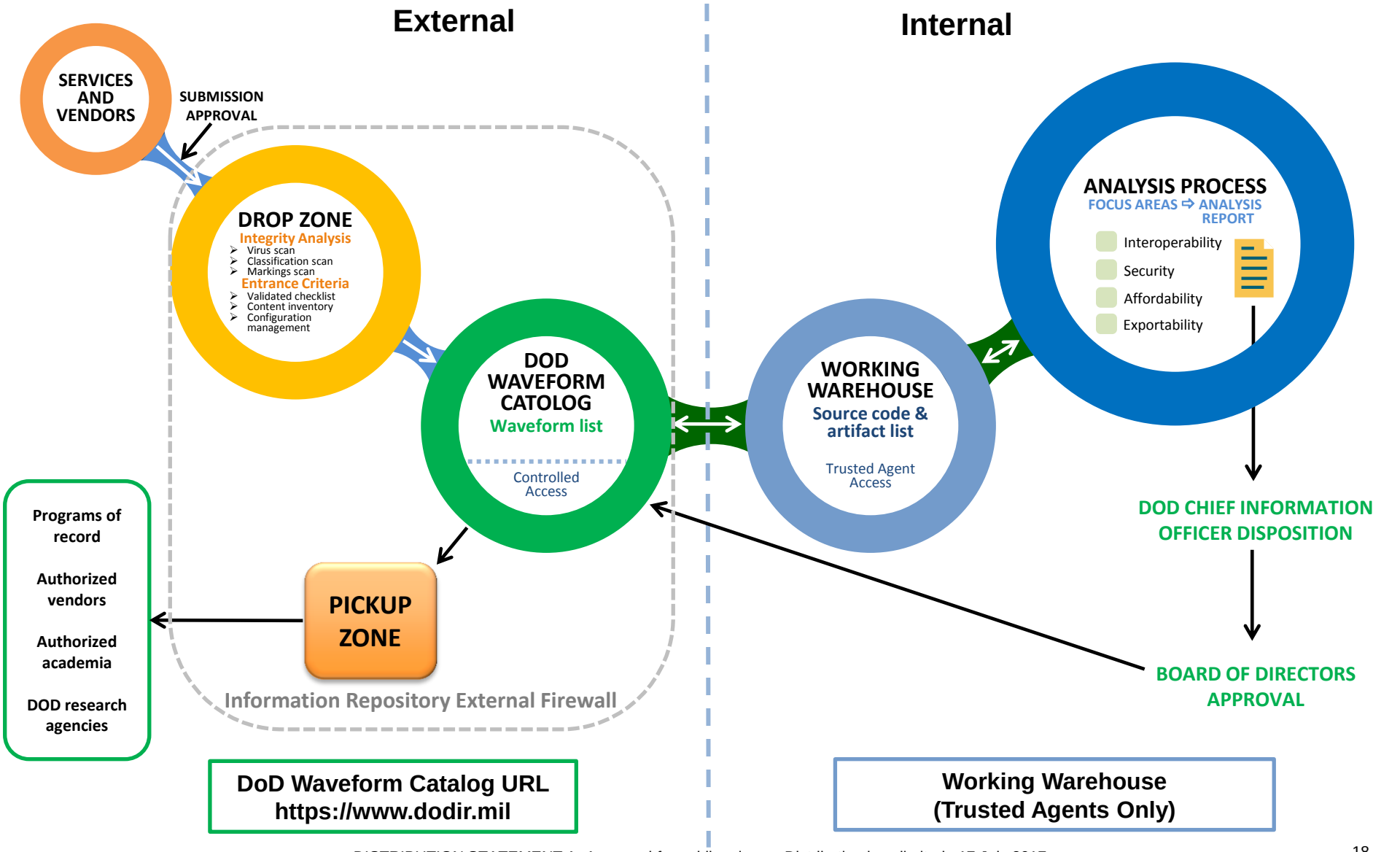
JTNC End-to-End Process



Export & International

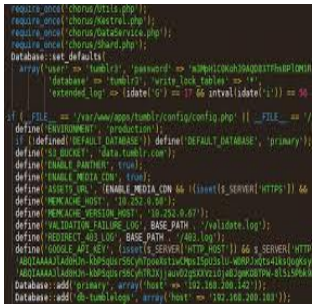
Export / International

SDR technology is changing rapidly, leading to new exportability challenges

Past
Hardwired radio

- Export of **Complete System**

Present
Software Defined Radio



- Export of waveform capability on a US SDR platform **(Complete System)**
- Export of waveform software only
- Export of SDR development environments only
- Export of DoD capability on Non-DoD platforms
- Export of commercial variants of DoD capabilities
- Export of systems with DoD capability using commercial cryptography

Export Activities:

- Support DoD CIO and the Services in providing waveform and SDR export recommendations
- Support the development of the DTSA DoD SDR & Waveform Export Policy
- Publish waveform Exportability Reports that analyze export potential, and promote the integration of international acquisition and exportability considerations into program documentation

International Activities:

- Support the Services in secure coalition communication interoperability activities (OCF)

Contact Information

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